

## Notes on the Donaciini (Col.: Chrysomelidae), with a List of Recent East Kentish Localities known to the Author

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The genera *Donacia*, *Plateumaris*, and *Macrolea*<sup>1</sup> together from a compact group or tribe, numbering 21 British species, of the section Eupoda of the Chrysomelidae, the larvae of which are aquatic, feeding upon the submerged stems of water plants, obtaining their oxygen supplies from the air-space of the plant tissues, and pupating in cocoons attached to the roots or other submerged parts. The adults are able to walk up and down through the air-water interface without any apparent respiratory difficulty<sup>2</sup>. They cling with such strength as to survive the attacks of frogs and fish, such as the rudd which abound in their habitats and which live chiefly by sucking snails and insects from the reeds. When active in the hot sun, however, they will on the collector's approach readily drop from their perches (if in a vertical position) or take flight (if in a horizontal one).

Most of the species are very handsome. With such metallic colouring as the majority possess, it is at first surprising that they are not more often seen; but most are uncommon (or at any rate, very locally distributed even though widely), apt to blend with their surroundings to a remarkable degree, and easily confused with the blemishes on the host-plants caused by snails and by the beetles themselves. This incidental camouflage combines with the relative inaccessibility of their habitats, a certain resistance to sweeping, and the often extremely limited extent of their colonies, to render some of the species very elusive indeed.

Nearly all the species must be searched for by close examination of reeds, sedges, and the floating leaves of certain water plants, and only in good weather. In bad conditions they usually remain under water or otherwise hidden, for instance if there is not enough sunshine, or a cold wind. Sweeping is of little use; the reeds are too stiff, and many of the beetles fly or drop long before the net reaches them — usually making a characteristic short flight and then plummeting on to the water and taking refuge amongst the vegetation. When at rest they cling to the reeds with such tenacity that the net does not dislodge them. Indeed it may be difficult to pull them off by hand, and often necessary to slide them upwards off the tips of the leaves. The sweep-net can however be of service when used, for instance, on grasses, etc. among sphagnum for *P. discolor*; and sometimes on sedge, where the growth is not too strong, for such species as *D. obscura*.

Of our 21 species, only *Donacia simplex* is at all common — if that is not too strong a term — and is perhaps the first to be met with, followed probably by *D. marginata*<sup>3</sup>. Several

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others, namely *D. semicuprea*, *vulgaris*, *versicolorea*, *dentata*, *bicolora*, and *Plateumaris sericea* and *discolor*, may be found by assiduous searching in most districts where their foodplants grow and the environment is suitable; nevertheless the beetles are more often absent than present<sup>4</sup>. The remaining species, namely *Donacia obscura*, *thalassina*, *impressa*, *clavipes*, *cinerea*, *aquatica* (*dentipes*), *crassipes*, *sparganii*, *Plateumaris affinis* and *braccata*, and *Macroplea mutica* and *appendiculata*, require not only assiduous searching but also some considerable measure of good fortune before they are discovered. The chance of success of course varies from place to place, and is evidently greater in counties such as Kent, Norfolk, and Cambridgeshire where there are large areas of fens or marshes<sup>5</sup>, provided that they are not polluted in any way. *D. sparganii* for example, scarce elsewhere, I know to be common in the Wicken Fen area, and can be found there without much searching. The distribution of nearly all of them, though sparse, is very wide, and recently for instance I came across *D. crassipes*, *D. impressa*, *D. obscura*, and *P. affinis* and *discolor* in a lake high in the mountains of North Wales — a more inclement locality would be hard to find. I have met with *D. clavipes* in places as far apart as Sandwich in Kent and Loch Morlich in Scotland. *D. obscura* alone of Donaciæ seems to be limited geographically, and so far as I know is confined to mountainous districts of Scotland and Wales<sup>5</sup>. *M. appendiculata*, which lives in rivers, has a discontinuous range that does not appear to include Kent — unless, of course, it remains to be found there; whilst *M. mutica* is confined (with rare exceptions) to brackish water near the coast.

All the species appear in June and July<sup>7</sup>, except the last-named insect which I find in May. Apart from *Macroplea* again, which persists until much later, they are mostly over (but for stragglers) by 20th July. That is to say, they disappear then. Since I have found *D. simplex* in the winter it is probable that they hibernate as adults in some inaccessible place, perhaps bottom mud or underwater reed stems<sup>8</sup>.

It would appear that each species has a specific foodplant — though this must be said with reservations<sup>9</sup>. Although for example we find *D. versicolorea* only upon *Pontamogeton natans*, and never to my knowledge in its absence, that may be because *P. natans* has floating leaves upon which the beetles conveniently display themselves. On the one occasion when I have come across *D. crassipes* (in a Welsh mountain lake) it sat in profusion on the leaves of *Nuphar luteum*, and there were none at all on *Nymphaea alba* — the principal foodplant recorded in the literature — which was more abundant there. The import of this is not clear<sup>10</sup>. It would, also, be difficult to pin down any of the *Carex*-feeding Donaciini to a particular species of the host genus, though they are of course limited to the truly aquatic varieties. I do however associate our two clearest cases (*D. obscura* and *P. affinis*) with *Carex rostratus*, a sedge having long erect seed-heads. *D. sparganii* I find only

on *Sparganium emersum* (*simplex*) and never upon *S. erectum* (*ramosum*), the common bur-reed, while *D. impressa* seems restricted to *Scirpus lacustris*. Such clear preferences are of some significance to the collector, in that since the search for these beetles involves such a lot of methodical legwork over likely areas, it helps enormously in cutting down the time spent if one postulates at all events primary foodplants. If one asks a local botanist where to find *Carex rostratus*, it enables one to start looking with just that much more enthusiasm and hope of success, with the knowledge that at least one is not looking on the *wrong* foodplant even if there are others.

Although not generally common, most of the species live in well-populated colonies, and once the first specimen is found others can be expected in the immediate vicinity: though not necessarily on the same day, as the rest may be under water or otherwise out of sight<sup>11</sup>. *D. crassipes*, *D. dentata*, and *D. versicolorea*, the three 'floating-leaf' species, I have found in great abundance in their localities — though this is far from being always the case — and the same applies to *P. affinis*, *P. braccata*, *D. clavipes*, *D. marginata*, *D. bicolora* and *D. sparganii*. I cannot speak for *D. aquatica*<sup>12</sup> and *D. thalassina*<sup>13</sup>, never having taken either; and *D. cinerea* once only — a single specimen. Of the remainder, *D. vulgaris* is often taken singly or in pairs, being the only species I find to be at all solitary in habit (but again this is by no means always so in others' experience); while *D. simplex*, *D. obscura*, *D. impressa*, *P. sericea* and *P. discolor* have far fewer individuals in their colonies, in my limited experience, than the several species listed above<sup>14</sup>.

There has been an evident decline in recent years in the incidence of these beetles, at least in Kent, and Mr. Allen has suggested to me that pollution may be the chief cause. Certainly the chemicals of cultivation, even if not causing pollution by herbicides, affect the pH of the water in drainage ditches on account of the lime and superphosphate they contain. I do not know if there is any correlation between the acid/alkaline reaction of the water and the distribution of the various species, except insofar as their foodplants are affected; but they do seem to be very particular as to their environment, and this may well be a factor<sup>15</sup>. Another and more obvious cause of their decline is the modern habit of scooping the bottom out of several miles of dike at a stretch with mechanical grabs, to clear the waterways. Certainly the best places to look for these beetles nowadays are in those fens and marshes which have been drained sufficiently for cattle and sheep pasture, but not for cultivation, and which suffer from neither of the above two evils. In the marshes of the Rother valley a few years ago I still found *D. versicolorea* and *D. dentata* in quantity.

*Localities in East Kent and the extreme South-East of Sussex*<sup>18</sup>.— In researching the local distribution of the Donaciini, the Canterbury area, with a radius of about twelve miles,

was particularly well covered, since for a considerable time my home was in that town. Only nine species were found within this limited area, and the number of localities discovered in all was, except for two or three species, pitifully small and quite out of proportion to the amount of work put in. A methodical attempt was made to cover at least a large representative part of each waterway system and its feeding ditches, using the Ordnance Survey maps; and most time was spent therefore in the large areas of low land around Westbere/Grove Ferry, Ash/Sandwich, Whitstable/Herne Bay, Faversham Creek, and Chislet/Reculver. The river Stour was followed for most of its length, and attention paid to the large lakes at Fordwich resulting from gravel workings; all this area proved particularly disappointing, but in this it was not unique, and more than once I nearly discontinued the project out of sheer frustration. As it was, I eventually extended the area of search to Romney Marsh and Winchelsea in Sussex. This produced a further four species before once again becoming unproductive. Even now that I have moved to Tenterden, no further species have turned up; yet so local are these creatures that it is impossible to say that others are not to be found.

(To be continued)

## Notes and Observations

HEAT ABERRATIONS OF *AGLAIS URTICAE* L. — It is common knowledge that, if the pupae of butterflies such as *A. urticae* are placed in sub-zero temperatures at a certain stage of their development, there is a good chance that the resulting butterflies, when they emerge, will not be normal. My own experience this summer has been in the opposite direction and resulted from submitting both larvae and pupae of *urticae* to above normal temperatures in a somewhat unintentional manner, and I feel the results were sufficiently interesting to make them worth recording.

During the first week in September, I found an almost fullfed brood of *urticae* larvae feeding on nettles in a paddock adjoining my garden. I collected the larvae housing them in a large breeding cage which, for want of anything better, I placed amongst the tomato plants in my greenhouse. Roof and side ventilators were kept permanently open but there were occasions when I forgot to open the door and, when this happened, the inside temperature, if the sun came out, rose quickly to 95°-100°F.

I placed a sheet of black polythene over the cage to shield it from the direct sun's rays, apart from which the larvae and pupae were left to fend for themselves. I noticed that the pupation of the larvae coincided with several particularly warm days. Many of the pupae proved to have been ichneumonated but of the two dozen or so butterflies that eventually emerged, all were varieties the majority extreme. In all cases the ground colour was a very bright brick red and the